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# Use of QuantiFERON-TB Gold to determine the aetiology of idiopathic erythema induratum: A case report

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**Abstract**

Although rare, erythema induratum is the most common entity presenting as lobular panniculitis with vasculitis. It is usually caused by a hypersensitivity reaction to *Mycobacterium tuberculosis*, although other aetiologies have been reported. We present a case of a 73-year-old male with multiple recurring tender erythematous nodules on the backs of both calves and shins. Prior to arrival in our clinic, the patient underwent a 9-month course of isoniazid with no improvement and subsequently received a diagnosis of idiopathic erythema induratum. We performed an interferon-gamma release assay QuantiFERON-TB Gold which was positive for *M. tuberculosis* infection. The patient was successfully treated with ethambutol 1.6 g for 1 month; pyrazinamide 2 g for 2 months; and isoniazid 300 mg, vitamin B6 25 mg, and rifampin 600 mg for 6 months. This case highlights the utility of using interferon-gamma release assay QuantiFERON-TB Gold and a multidrug regiment over isoniazid in erythema induratum.

**Keywords**

Erythema induratum, nodular vasculitis, *Mycobacterium tuberculosis*, QuantiFERON-TB Gold

## Introduction

Erythema induratum (EI), also referred to as EI of Bazin, Bazin's disease, and nodular vasculitis, presents as a lobular panniculitis with vasculitis and is usually diagnosed through a combination of clinical and pathological features. It is thought to be a type-IV hypersensitivity reaction, most commonly to the tuberculosis (TB) antigen.[1,2] Other aetiologies reported in the literature include: *Nocardia, Pseudomonas, Fusarium* and hepatitis B infections, thrombophlebitis, hypothyroidism, leukemia, rheumatoid arthritis, Crohn's disease, and propylthiouracil use.[3] EI may also be idiopathic and affects females with a ratio of 10:1.[4] While the peak incidence of EI has been reported to be in the 30- to 40-year-old age group, older individuals and children are not spared.[1,5,6]

EI is rare, making up less than 0.1% of TB manifestations.[7] However, while the rate of TB infection is declining in Canada and the United States, it is still prevalent in marginalized populations such as Status Indians in Canada, African Americans, and immigrants.[8,9] Therefore, the ability to recognize, diagnose, and treat EI is important for clinicians working with these groups.

Here, we report the case of a patient with a previous diagnosis of idiopathic EI who tested positive to TB infection using the interferon-gamma release assay (IGRA) QuantiFERON-TB Gold and subsequently was successfully treated with a multidrug regimen.

## Case report

A 73-year-old man presented with multiple recurring tender erythematous nodules on the back of both calves and to a lesser extent the shins (Figure 1). The nodules resolved without ulcerating but left post-inflammatory hyperpigmentation (Figure 2). These recurring nodules had been present for 16 years. Prior to arrival in our clinic, the patient had been treated with a 9-month course of isoniazid with no improvement. He was worked up extensively for alternative aetiologies, with no significant findings and thus, he arrived at our clinic with a diagnosis of idiopathic EI.

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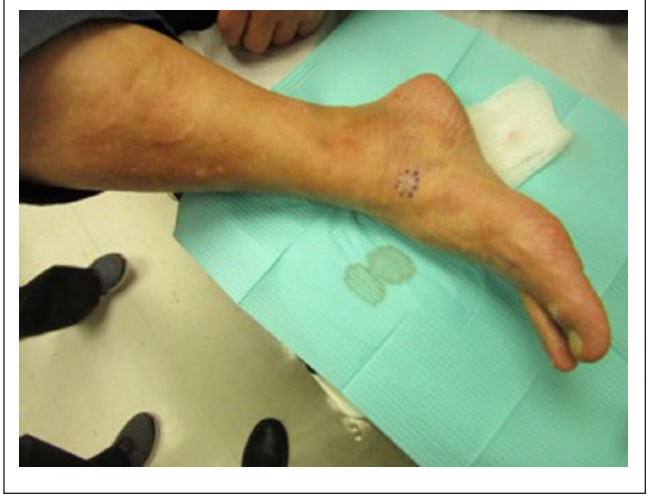

**Figure 1.** Multiple recurring tender erythematous nodules on calves.

**Figure 2.** Post-inflammatory hyperpigmentation.

The patient was born in Tanzania, did not receive the bacille Calmette-Guerin (BCG) vaccination, immigrated to Canada in the 1970s, and traveled broadly. His comorbidities included hypertension, dyslipidemia, benign prostatic hyperplasia, hypothyroidism, essential tremor, and muscle fasciculations with increased serum creatinine kinase. The patient had no constitutional signs of infection, a clear chest x-ray, no palpable lymph node, a lower than normal hemoglobin at 118 g/L, and an elevated erythrocyte sedimentation rate (ESR) at 41 mm/h. All other lab values were within normal range. We performed a punch biopsy that was consistent with stasis changes. A biopsy from 2007 showed a dense inflammatory infiltrate of lymphocytes with focal collections of histocytes and granuloma formations in the subcutaneous tissue and increased fibrosis of the fibrous septa. A further biopsy was performed in 2009, but was unavailable. Despite the patient's prior treatment for latent TB infection, he was never investigated with tuberculin skin test (TST) or an IGRA. Therefore, the patient underwent an IGRA QuantiFERON-TB Gold test (Cellestis Ltd, Carnegie, Victoria, Australia), which was positive for TB infection at >10 IU/ml (values of >0.34 IU/ml are considered positive).

The positive result prompted a referral to infectious disease. The patient received first-line treatment for active TB, including isoniazid 300 mg, vitamin B6 25 mg, and rifampin 600 mg for 6 months; pyrazinamide 2 g for 2 months; and ethambutol 1.6 g for 1 month. Liver enzymes were monitored. The patient reported no new nodules or tenderness after 4 months of treatment, although hyperpigmentation remained. A 1-year follow-up revealed no recurrent nodules.

## Discussion

The present case outlines two important aspects of EI diagnosis and treatment—the use of an IGRA to investigate the aetiology and the use of a multidrug regiment for the treatment of TB-associated EI. Unlike the TST, the IGRA uses antigens that are not present in the BCG vaccine and most nontuberculous mycobacteria; therefore, it a more specific test for *Mycobacterium tuberculosis* infection. While the TST is the current standard in Ontario, Canada, to diagnose latent TB infection, the IGRA may be a more appropriate test for patients with EI, especially those patients who have received the BCG vaccination.[1,10,11] If a TB aetiology is established, it is recommended that patients be treated for 6 or 9 months with isoniazid, rifampin, ethambutol, and pyrazinamide.[2,3] Despite this, prior to presentation at our clinic, our patient was only treated with a 9-month course of isoniazid. Failure of this treatment resulted in our patient receiving a diagnosis of "idiopathic EI." Therefore, while this recommendation has been made before, this case further emphasizes the need to treat patients with TB-associated EI with a multidrug course instead of monotherapy with isoniazid. Furthermore, while some studies recommend treating all patients with EI with anti-TB medications, even with no evidence of TB infection, the benefit of this may not outweigh the risks, given the serious side effects of anti-TB drugs and the other possible aetiologies of EI.[2,3]

### Declaration of conflicting interests

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## Informed consent

Written informed consent for patient information and images to be published was provided by the patient.

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